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ABSTRACT

Microcomputers in schools contribute significantly to the learning process, and software selection is taken as seriously as the selection of text books. The seven step process for responsible software selection are: (1) analyzing needs, including the differentiation between needs and objectives; (2) specification of requirements; (3) identifying promising software, with a discussion of possible sources of information; (4) reading relevant reviews and where to find them; (5) previewing software with intended student group; (6) making recommendations on software for purchasing; and (7) getting post-use feedback to determine the conformance or discrepancy between objectives and actual student performance. (Contains six references.) (MAS)

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ERIC DIGEST

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Seven Steps to Responsible Software Selection

In the early 1980s, relatively inexpensive microcomputers came on the market, the personal computer was selected *Time* magazine's "man (machine) of the year," and school administrators rushed to buy early generation Apple, TRS-80, Commodore, or similar computers for their schools. Educational software was limited, and what little there was consisted mostly of "drill and practice" electronic worksheets. Teachers often selected software from catalogs, choosing almost any software that remotely touched on the subjects they were teaching. Often they were disappointed when the software arrived. Almost fifteen years later, microcomputers in schools are no longer a novelty, but contribute significantly in the learning process, and software selection is taken as seriously as the selection of text books. This Digest will outline a seven step process for responsible software selection.

Step 1. Analyze Needs

The responsible teacher (or materials selection committee) should first determine whether or not the computer is the appropriate medium to use to satisfy particular instructional **goals** and **objectives**. There is always the possibility that a careful needs analysis will result in a decision to use some other teaching-learning strategy.

- **Needs & Goals.** A **need** is the difference between "where we are now" (e.g. 60% of the students in the ninth grade score above minimum competence on the state science test) and "where we would like to be" (e.g. 90% of the students in ninth grade score above minimum competence on the state science test). "Where we would like to be" is another way of defining a **goal**.
- **Objectives.** An **objective** describes "where we would like to be" in more specific terms (e.g. 90% of all ninth grade students will exceed the minimum level of competence on the state competency test administered in the second semester of ninth grade). Objectives must include conditions under which the desired behavior will be demonstrated and the criteria for measuring that behavior.

Educational objectives help us respond to needs by breaking them down into attainable steps, making it easier to get from "where we are now" to "where we would like to be." The educational objective stated above is a "terminal" objective which must be broken down into a series of "enabling" objectives (e.g. By October 31, 1995, all ninth grade students will be able to correctly identify at least five out of seven minerals when shown them by the teacher.) Enabling objectives identify specifically what behavior we would like the student to demonstrate. For each enabling objective, the teacher (or materials selection committee) should brainstorm alternative learning methods for achieving that objective—direct student teacher interaction, self-instruction workbook, videotape, computer assisted instruction, etc.

After considering the **benefits** and **constraints** of each learning method, the teacher (or materials selection committee) should be able to make an informed decision about which medium or combination of media will satisfy the identified needs, goals, and objectives.

Step 2. Specify Requirements

If a careful needs analysis determines that computer assisted instruction is one of the methods that will be used to meet identified instructional objectives, the teacher (or materials selection committee) should then specify the requirements for the computer software. Factors to consider in specifying requirements for software include: compatibility with available hardware; cost (Will the school need multiple copies of the software? Will a site license be necessary?); user friendliness; level of interaction desired; adequacy of documentation; access to technical support via toll-free number; and of course, direct correlation with the instructional objectives and curriculum requirements identified in the needs analysis. Ellsworth and Hedley (1993) suggest that educators should apply the following criteria within the context of their objectives and the students' needs: content; instructional presentation; demands placed on the learner; technical features; and documentation and management features.

Step 3. Identify Promising Software

If requirements are specified in detail, the teacher (or materials selection committee) will have a good head start when it comes to identifying promising software. There are many ways to identify promising software, and the responsible selector should use as many of them as possible. Catalogs still remain an important source for descriptions of software. Most district level educational communications/media centers are on catalog mailing lists from virtually all software producers and wholesalers. Software is advertised, described, and often reviewed in magazines and journals found in school, university, and public libraries. The Educational Products Information Exchange (EPIE) produces The Educational Software Selector (TESS), a database containing descriptions and reviews of thousands of currently published educational software programs.

Teachers who have access to the Internet can find out about software from other teachers by joining a listserv. Posting a question such as, "I am an eighth grade science teacher and I am looking for interactive software for a PC environment that will teach my students how to . . . " is likely to bring dozens of responses. Many listservs are archived on the AskERIC Virtual Library gopher (gopher ericir.syr.edu) or WWW site

(http://ericir.syr.edu). Directions for joining a listserv may be found in the archives, or e-mail AskERIC@ericir.syr.edu for more information on listservs.

The above are but a few sources for identifying promising software. The more precisely the requirements are specified in Step 2, the easier it will be to screen out those products that are least likely to meet the user's specifications and the easier it will be to focus on more promising products.

Step 4. Read Relevant Reviews

After a list of promising software has been identified (using the suggestions outlined in Step 3), the teacher (or materials selection committee) may be able to narrow or expand the list by reading relevant software reviews. It is very important to realize, however, that reading reviews should not take the place of **previewing**, described in Step 5. Software reviews may be found in educational journals, some of which may be identified by searching the ERIC database using appropriate descriptors (e.g. software, selection, evaluation, elementary, secondary). For example, Heyboer and Mayo, in the January 1993 issue of *Teacher Magazine*, describe 12 computer software programs available for elementary and secondary math and science classes. Evaluation services such as EPIE, subscribed to by many school and public libraries, provide a database of selected software evaluations and reviews. A visit to the library is an important part of responsible software selection. Keep Step 1 (Analyze Needs) and Step 2 (Specify Requirements) in mind as you read the reviews. It is also important to note the audience upon which the review is based. A software program may have received a poor review because it was tested with a different audience than the one you have in mind. Reviews are important screening tools when used as part of the entire selection process.

Step 5. Preview Software

The most effective way to judge whether software is appropriate or not is to observe students as they interact with the program. Are the educational objectives achieved when the student uses the program? The responsible teacher should not purchase software without previewing it with his or her own students. Preview as many programs as you can find that appear to meet your selection criteria. Some software vendors will allow free preview of an entire program. Some vendors will provide a free demonstration disk containing a subset of a larger program. Some vendors will not allow preview without a purchase order, but will allow the teacher to return the program within a specified time limit with no financial obligation. In some situations, a teacher may be able to borrow a program from another teacher for preview purposes. As a general rule, if there is no way to preview software with your own students—avoid that software.

Step 6. Make Recommendations

After potential software has been previewed, it is time to make recommendations for purchase. The responsible software selector should be able to:

- select the most desirable software after a systematic evaluation of all alternatives in terms of educational objectives and constraints;
- establish a quantitative method for rating each alternative against the selection criteria established in Step 2;
- evaluate the relative importance of each selection criterion, (ie. previewing should probably be rated relatively high in importance); and
- create a written record outlining the reasons why a piece of software is recommended or not recommended for purchase.

For software that is recommended for purchase, teachers should include suggestions for optimal use that might have become apparent during the preview period. The written record, including the quantitative rating scale and the selection criteria, should be kept on file for future reference.

Step 7. Get Post-Use Feedback

After software is purchased and used with students, it is important for the teacher to determine the conformance or discrepancy between all of the enabling objectives specified in Step 1 and the student performance actually obtained using the chosen computer software. The teacher should keep records on the relative extent to which each objective is met or not met. Objectives not met may be addressed by some other software program or by another teaching/learning method. Post-use feedback can be a significant help to a school's systematic process of software selection, purchase and use. The accumulation of user feedback, including anecdotal experience on the part of both teachers and students, will naturally serve to improve future needs analyses (Step 1) and all succeeding steps in a constantly improving software selection process.

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